character of weather or climate, still a knowledge and an understanding of the principles of meteorology will make for a general increase of efficiency.

But since the general education of the majority in this country does not yet include such a knowledge of the atmosphere and of the elements of physics and dynamics as will render meteorological and climatological descriptions fully intelligible, this introduction to modern meteorology has been issued by the Meteorological Office for the benefit, in the first instance, of those who are making use of meteorology in the present war.

In calling it "The Weather-Map" Sir Napier Shaw lays stress on an essential condition of weather-forecasting which is usually overlooked by those who are not conversant with its procedure, namely, that success depends not upon the skill or the long experience of a single observer, but upon the organised collection of information from as wide a circle of observers as possible, which can then be plotted on a map of the region. Similar maps prepared at intervals of a few hours enable the trained meteorologist to see what changes are taking place, and he can then draw his conclusions as to those which will take place in the near future. When this is generally known and more widely understood, the advantage of preparing forecasts at one centre will be recognised, since it provides much fuller information, and that on a surer basis than is possible for a single observer of long local experience only. But if the local meteorologist is provided with such a weather-map, he can by his knowledge of local conditions amplify with advantage the general deductions of the central institution.

The construction of a weather-map, therefore, is here considered in detail. First, the weather at a number of stations in the British Isles and the North of France on the afternoon of a summer day last year (6 p.m., August 2, 1915) is shown cartographically, and similar maps show the distribution of the winds, the temperature, and the pressure on the same occasion. The distribution of each is explained and discussed so as to lead up to the normal weather-map, on which all these factors are represented together.

This brings us to a short reference to the sequence of weather and its classification according to a few simple types of pressure distribution, and two examples are given of the effect of notable cyclonic depressions which have passed over the British Isles. A series of five maps represents the movement of the depression of November 12–13, 1915, which gave rise to severe gales on our coasts, and four others enable the reader to follow the changes which took place in wind, weather, etc., as the deep depression of December 27–28 of the same year passed over these islands. From the careful description of a weather-map here given anyone can obtain a clear idea of the utilisation of meteorological observations for practical needs. But to ascertain the physical causes of the variations which are shown upon the map, so that we may deal with them as events following causes, is the general problem of the application of the sciences of dynamics and physics to the atmosphere—a problem of the highest interest, but of the utmost difficulty.

The upper air and the conditions prevailing there are shortly described, but the reader is warned that in order to go further he must make himself acquainted with words and ideas which may be unfamiliar to him if he is to make intelligent use of the information which modern meteorology provides. To assist him in this a glossary of brief explanations of many technical meteorological terms and short articles on kindred matters is stated to be in preparation. As a supplement are given climatic summaries for London and Paris, and for Philippopolis, Babylon, Cairo, and Dar es Salaam as representing the types of climate in various theatres of war. The form which these take is somewhat different from that which is ordinarily met with in works which treat of climate. The extreme conditions and the variation of the climatic factors are more important in military operations, etc., than the mean values with which the climatologist is usually concerned. Hence we find that the greatest and least recorded rainfall for each month are given, as well as the average number of days in each month on which rainfall was between certain fixed limits, viz. 1–5, 6–15, 16–25 mm. Similarly, besides the absolute extremes, the normal monthly extremes of temperature are given as indicating the range of temperature to be anticipated in each month; and as for rainfall, a table showing the average number of days in each month on which the maximum and minimum temperatures fall between certain limits clearly exhibits the march of temperature throughout the year and the special character of each month.

These tables, together with a series of isoplethic diagrams of the mean temperature, pressure, wind, rainfall, and humidity at the four observatories of the Meteorological Office, should appeal to everyone as giving climatological information in a form peculiarly suited to practical needs.

This elementary introduction to meteorology will appeal to a much wider circle than those whose present duties on service require the use of meteorological information, for it will be found most useful in all schools where the daily weather-maps are in use as an exposition of their construction and of their place in meteorological science.

H. G. L.

THE ROYAL SOCIETY'S CATALOGUE OF SCIENTIFIC PAPERS.

Catalogue of Scientific Papers. Fourth Series (1884–1900). Compiled by the Royal Society of London. Vol. xv., Fitting–Hyslop. Pp. vi+1012. (Cambridge: At the University Press, 1916.) Price 2*l*. 10*s*. net.

THE Royal Society is to be congratulated on the publication of the fifteenth volume of its Catalogue of Scientific Papers. The first twelve

© 1916 Nature Publishing Group

volumes of the catalogue cover the period 1800 to 1883, forming an alphabetical list of authors' names, with the titles of all the papers they published during those years. The volume now issued is one of a series which will complete the work to the end of the year 1900.

Vol. xv. contains the names of authors from "Fitting" to "Hyslop," so that three volumes are required to reach the end of letter H in the alphabet. It would appear, therefore, that eight volumes may be needed to index the literature of the seventeen years 1884–1900, whereas the papers published in the eighty-four years 1800–1883 could be indexed in twelve volumes.

The volumes for 1884–1900 so far published have been produced under the direction of Dr. Herbert McLeod, whose love of accuracy is well known. An examination of vol. xv. reveals the extreme pains that have been taken to render every detail correct. We would particularly direct attention to the care taken to avoid confusing authors of the same name. Where the director has been unable to satisfy himself as to the identity of an author whose surname alone is given in the paper, that fact is duly indicated. At the present time, when England and Russia are drawn together by common interests, we are glad to observe many entries in Russian characters, such entries having a translation for the convenience of those who are not yet able to read the language of our Ally.

We very much regret that Dr. McLeod has been obliged, through ill-health, to resign the directorship of this work. In the volumes of the catalogue published under his direction he has set a standard of accuracy which is hard for any successor to attain. We hope that Dr. McLeod has been able to leave the manuscript for the remainder of the author index for 1883–1900 so far complete that the Royal Society will have no difficulty in publishing it.

Although a work of this character should find a place upon the shelves of every scientific library, it is obvious that the expense of its production must be too great to be covered by the sales. The late Dr. Ludwig Mond and other generous friends of the undertaking provided funds to make up the deficit. The Catalogue Committee of the Royal Society found that these funds were practically exhausted by the end of 1914. This has not deterred the Society from continuing the publication of the series of volumes. In so doing it has acted in the interest of science, for a work of this kind is most valuable when the papers indexed are still of living interest.

It will be remembered that the Royal Society's Catalogue of Scientific Papers is designed to index all the scientific literature of the nineteenth century. The corresponding work for the twentieth century has been undertaken by the International Catalogue of Scientific Literature, which has already carried on the index from 1901 to 1913.

"L'HOMME MACHINE."

Man—An Adaptive Mechanism. By Prof. G. W. Crile. Pp. xvi+387. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1916.) Price 10*s*. 6*d*. net.

ACCORDING to Prof. Crile, the proper term for describing man is mechanism. "Man is essentially an energy-transforming mechanism, obeying the laws of physics, as do other mechanisms." This obedience to the laws of physics is generally admitted by biologists; the question is whether the mechanistic (or chemico-physical) description, which is true so far as it can go, is exhaustive and adequate. Prof. Crile insists that it is, but when we find him including in his conception of mechanism "the fabrication of thought" (by which the mechanical formulæ were themselves fabricated), we wonder if he has sufficiently considered his position. He seems to us to have passed insidiously from a scientific materialism which is admittedly a progressive working hypothesis in physiological research to a philosophical materialism which holds that a true and full description of the world can be given in terms of matter and motion.

When we lay down the mechanically heavy but psychically lightsome volume, and ask ourselves what its chief contributions are, we may select the following. (1) The author gives many forcible illustrations of the unity of the organism. In the web of behaviour what we call mental and what we call bodily are inextricably interwoven. More than that, the whole bodily life is correlated with a subtlety which can scarcely be exaggerated, verifying St. Paul's remark that the various members of the body work as if they had "a common concern for one another." The author gives a very vivid account of the physiological linkage concerned with the transformation of potential into kinetic energy. In this "kinetic system" "the brain is the initiator of response, being activated by the environment within or without the body; acting like a storage battery, it contributes the initial spark and impulse which drives the mechanism. The adrenals act as oxidisers, making possible the transformation of energy and the neutralisation of the resulting acid products. The liver is the chief fabricator and storehouse of the carbohydrate fuel by which muscular action and heat are produced. The liver also plays a large *rôle* in the neutralisation of the acid products of the transformation of energy. The muscles are the engine or motor in which is consummated the final step in the transformation of energy into heat or motion. The thyroid, by supplying a secretion which facilitates the passage of ions, would seem to be the organ of speed control, governing the rate at which the transformation of energy is effected."

(2) Distinctive of the book is the emphasis laid on acidosis, or increased concentration of H-ions in the blood. This may be induced, as is shown in well-illustrated detail, by excessive muscular activity, excessive emotional activation, surgical

© 1916 Nature Publishing Group